

WHAT IS CLAIMED IS:

1. A semiconductor device including a surge protection circuit electrically connected to a signal input terminal and having a diode and a transistor, comprising:

5 a semiconductor substrate having a main surface;

a field oxide film formed at the main surface of said semiconductor substrate; and

10 a first conductive layer formed on the main surface of said semiconductor substrate and electrically connected to said signal input terminal,

15 said diode having its cathode including a first cathode region and a second cathode region, said first cathode region being electrically connected to said first conductive layer and formed at the main surface of said semiconductor substrate, and said second cathode region constituting, together with an anode region of said diode, a pn junction where Zener breakdown occurs, and

said pn junction where the Zener breakdown occurs being distant from said field oxide film.

2. The semiconductor device according to claim 1, wherein

5 said cathode and a collector of said transistor are electrically connected to said signal input terminal, and said anode and a base of said transistor are formed to be of the same conductivity type and electrically connected to each other.

3. The semiconductor device according to claim 1, wherein
said second cathode region is formed to cover a side or upper surface of said anode region.

4. The semiconductor device according to claim 1, wherein
said anode region is formed to cover a side or upper surface of said second cathode region.

5. The semiconductor device according to claim 1, wherein
said anode region and said second cathode region constituting the
pn junction where Zener breakdown occurs are both formed within an
epitaxial layer formed in said semiconductor substrate.

6. The semiconductor device according to claim 1, wherein
said transistor has its collector including an epitaxial layer formed
in said semiconductor substrate and a first buried layer formed in said
epitaxial layer,

5 said transistor has its base including a second buried layer formed
in said epitaxial layer, and
said first buried layer has its impurity concentration higher than
that of said epitaxial layer and is adjacent to said second buried layer.

7. The semiconductor device according to claim 6, wherein
a part of said second buried layer that is adjacent to said first
buried layer is a low-concentration region having a relatively low impurity
concentration.

8. The semiconductor device according to claim 7, further
comprising a second conductive layer formed on the main surface of said
semiconductor substrate, wherein

5 the base and the emitter of said transistor are both electrically
connected to said second conductive layer.

9. The semiconductor device according to claim 1, wherein
said transistor has its collector including an epitaxial layer formed
in said semiconductor substrate and a diffusion layer formed in said
epitaxial layer, and said diffusion layer has its impurity concentration
5 higher than that of said epitaxial layer.